

CITY OF SANTA BARBARA WATERFRONT DEPARTMENT

MEMORANDUM

Date: May 19, 2016
To: Harbor Commission
From: Scott Riedman, Waterfront Director
Subject: Annual Review—Clean Marina Program

RECOMMENDATION:

That Harbor Commission review and consider an annual report on the Department's Clean Marina Program.

BACKGROUND:

City Council adopted a Clean Marina Program (Program) in 2002. Its goal is to achieve and maintain, via feasible means and alternatives, best management practices and a clean harbor environment for people, aquatic life and seabirds. Staff reports annually on the status of the Program to the Harbor Commission.

The Program includes six elements:

- | | |
|------------------------------|--|
| 1. Facilities for Boaters | 4. Pollution Prevention and Abatement Projects |
| 2. Water Quality | 5. Education |
| 3. Best Management Practices | 6. Compliance and Enforcement |

DISCUSSION:

1. Facilities for Boaters

A. Sewage Pump-Outs

The harbor's five sewage pump-outs accommodate boaters and reduce the likelihood of sewage spills. City Council recently approved a Department request to apply for a \$73,000 grant from the state's Division of Boating and Waterways to replace the four most-used pump-outs in the harbor.

Total sewage pump-out use in FY '15 was 5,218 minutes, or about 200,000 gallons of effluent diverted to the City's sewer system.

Sewage Pump-Out Use (In Minutes)

<u>Fiscal</u> <u>Year</u>	<u>Marina 1</u> <u>East*</u>	<u>Marina 1</u> <u>West</u>	<u>Fuel</u> <u>Dock</u>	<u>Launch</u> <u>Ramp</u>	<u>Annual</u> <u>Total</u>
FY '03	5165	1253	1421	73	7912
FY '04	4957	1069	1310	135	7471

FY '05	4758	758	2183	3	7764
FY '06	4384	1657	2608	362	9011
FY '07	3796	1269	1666	27	6785
FY '08	3834	1172	2207	15	7228
FY '09	3690	976	1464	252	6382
FY '10	3876	896	1336	179	6287
FY '11	4128	884	1204	217	6433
FY '12	3652	1807	2085	198	7742
FY '13	3802	336	2249	437	5938
FY '14	3082	417	1864	224	5587
FY '15	3002	1221	852	143	5218

* Two stations, P/Q finger and R/S finger

B. Bilge-Water Pump-Out

A bilge-water pump-out at the Fuel Dock accepts bilge water mixed with either oil or diesel, but cannot accept gasoline or “hot loads” with contaminants like soap, which must be disposed of at a Household Hazardous Waste Facility. The pump-out sends oil to a waste-oil container and residual water into the City’s sewer system. The facility removed 7,370 gallons of bilge water in 2014, 32% above its 12-year average.

Bilge-Water Pump-Out Use

<u>Year</u>	<u>Minutes</u>	<u>Gallons</u>
2003	1,086	5,430
2004	1,602	8,010
2005	1,416	7,080
2006	1,353	6,765
2007	1,546	7,730
2008	N/A	N/A
2009	629	3,145
2010	948	4,740
2011	813	4,065
2012	895	4,475
2013	728	3,640
2014	927	4,635
2015	1,474	7,370

C. Debris Nets

Over 40 debris nets located on finger docks help boaters remove light debris from the harbor. Some nets disappear or rot out each year. Maintenance staff typically spots nets that need replacement during dock construction and repair. In 2015, they replaced 10 nets, same as the past three years.

Debris Nets Replaced

<u>Year</u>	<u>Nets</u>
2008	15
2009	7
2010	8
2011	6
2012	11
2013	10
2014	10
2015	10

D. Waste-Oil Disposal

The Department operates waste-oil disposal stations at the Fuel Dock, Marina 2 and Marina 4. These free facilities also accept oil filters, anti-freeze and oil-absorbent bilge pads. Staff has tracked the number of gallons of oil received at these stations since FY '11. The FY '15 total was slightly lower than the five-year average, but well above the FY '14 (possibly anomalous) total. Staff will continue to carefully monitor usage of the waste-oil disposal facilities.

Waste-Oil Disposal

<u>Year</u>	<u>Gallons</u>
FY '11	7,585
FY '12	6,675
FY '13	7,145
FY '14	2,500
FY '15	4,620

E. Marine Battery Collection

The Department provides a marine battery collection bin on the City Pier near the Fuel Dock, and Interstate Batteries hauls away the batteries for free. Typically, the Fuel Dock receives more batteries to recycle than it sells. In 2015, it sold 137 batteries and received 180 for recycling—slightly less than the previous year but in general keeping with the annual number of recycled batteries since 2013.

Batteries Recycled

<u>Year</u>	<u>Batteries</u>
FY '09	450
FY '10	350
FY '11	300
FY '12	290
FY '13	200
FY '14	220
FY '15	180

F. Fishing Line Recycling

The Department currently provides two fishing-line recycling stations—one at Stearns Wharf Bait and Tackle and one on the passenger-carrying fishing vessel *Stardust* at Sea Landing. In 2015, anglers deposited 5.5 pounds of line at Stearns Wharf (compared to eight pounds in 2014).

In turn, anglers deposited 27 pounds of line aboard the *Stardust*, compared to 25 pounds in 2014, the first year operating this receptacle, and a breakthrough in accommodating recycled line that would otherwise end up in the trash or the ocean. Staff is currently working with Sea Landing to place a fishing-line recycling container and related signage on the *Coral Sea*, a passenger sportfishing boat added to the Landing's charter fleet last year. While Santa Barbara remains the only harbor statewide with fishing-line recycling containers on its passenger fishing boats, the state has reached out to 24 other such operations in the San Francisco Bay area, urging them to do the same.

2. Water Quality

A. Monthly “Dry Season” Harbor Water Quality Monitoring

Seven stations were tested for three bacterial indicators between April and October, 2015. Only one sample, taken just outside the Harbor entrance (Station #13), exceeded state standards for body contact (Attachment 1). Possible causes for this considerable exceedance include lab error, bird or marine mammal waste or possibly a vessel that dumped its head before entering the harbor. In any case, it serves as a reminder that state bans dumping inside three miles of land. An environmentally preferred alternative is to “dump at the pump” in the harbor. A map of the harbor's bacterial sampling sites is included as Attachment 2.

B. East Beach Water Quality Monitoring

Coastal Commission permit conditions for the East Beach Mooring Program require twice-yearly water-quality testing in the mooring area for heavy metals and three times a year for bacteria. Results remain consistent with baseline results from 2006, indicating good water quality in the project area (Attachment 3). Sampling sites are depicted in Attachment 4. Per the Department's Coastal Commission permit, the testing requirement will be waived moving forward, since the area has tested “clean” for 10 consecutive years. This will save the Waterfront Department nearly \$8,000 per year in Clean Marina Program costs.

C. Dissolved Oxygen Tests

The Department tests dissolved oxygen (D/O) levels in the harbor to predict and report low-oxygen events that cause fish and invertebrate die-offs. Twelve D/O tests were conducted in 2015. Results (Attachment 5) indicate generally good oxygen levels (five milligrams per liter of water) except for a few sub-optimal readings in spring and fall, including very poor readings in October, when El Niño-

related water temperatures in the harbor rose to 72 degrees Fahrenheit. When D/O levels are dramatically low, the Department posts marina gates so crab and lobster fishermen who store their catch in receivers can move them outside the harbor to avoid “dead loss.” This occurred three times in 2015, compared to twice in 2014. Fishermen should alert the Department immediately if they experience high dead-loss, so staff can test D/O levels. There were no fish die-offs in 2015.

D. Anti-Fouling Paints (AFPs)

In response to studies indicating elevated copper levels in many Southern California harbors, the Department has experimented with non-copper AFPs on its Patrol boats since 2009. Tests included ceramic-based paints whose slick surface is designed to slough marine growth, zinc-based paints and paints with a biocide compound intended to repel marine growth.

Unfortunately, none of these alternatives performed to expectation, especially for high-use patrol boats. Ceramic paints proved too delicate, enduring scratches when lightly scrubbed, which in turn encouraged marine growth in those spots. Biocide paints wore off three months after application. Zinc-based paints flaked, peeled and appeared to increase electrolysis on the aluminum hulled Patrol Boat #3. Biocide paints also peeled and performed poorly.

The latest AFP alternatives feature paints that are a blend of copper and biocide compounds, with copper content reduced by up to one-third. Patrol Boats #2 and #3 will be coated with this type of paint this summer. Since Patrol Boat #1 will be replaced within a year, staff is considering either the mixed-compound paint described above or a new water-based, copper-free, self-polishing antifouling paint, which includes a purported slime-resistant compound. Before painting any patrol boat with this water-based coating, staff will test it for a few months on its 20' maintenance barge to see how it holds up in a workboat environment.

Staff will keep monitoring research in this field, with an eye toward testing new non-copper or reduced-copper products appropriate for patrol-boat application.

E. Industry's Clean Marinas Program

The Clean Marina Program is a multi-state, industry-sponsored certification program designed to reflect compliance with strict environmental and best-management practices to prevent ocean pollution. The Program has certified 127 California marinas since 2004. Santa Barbara Harbor was certified in 2006 and recertified in 2011. Another recertification is scheduled for fall, 2016.

3. Best Management Practices (BMPs)

A. Storm Water Pollution Prevention Plan

The Department complies with federal Clean Water Act (Act) standards through its Stormwater Pollution Prevention Plan (SWPPP), whose goal is to prevent

pollution discharges into the harbor. The SWPPP includes a description of the entire Waterfront and potential sources of stormwater discharge, plus BMPs to maintain the area so that stormwater does not become contaminated as it flows off Waterfront property.

Significant changes were made to the program last year for all businesses and agencies subject to regulation under this provision of the Act. Visual observations are now made monthly instead of quarterly and stormwater runoff samples from areas considered industrial within the Harbor Commercial area are captured during four storm events per year instead of two. Results will be compared to Numeric Action Levels (NAL) adopted for each contaminant. Best Management Practices will have to be revised if results exceed NALs. No actionable events were reported in 2015.

B. Storm Water Management Plan

In 2009, the City completed a state-mandated Stormwater Management Plan (SWMP), which includes several Minimum Control Measures (MCMs—like public outreach, illicit Discharge detection and BMPs) to help maintain good water quality in our harbor. As part of the City's overall SWMP, the Waterfront developed MCMs specific to its operations. To date, the Waterfront is compliant and current with the SWMP and will continue to work closely with the RWQCB to modify the document as appropriate.

C. Diver BMPs

All hull-cleaning dive companies are trained and certified in BMPs for minimizing paint discharge into the harbor. Patrol Officers are similarly trained. Training for newer officers and dive-service staff, offered by the California Professional Divers Association, is scheduled for June 11, 2016 in Santa Barbara Harbor.

D. Staff and Contractor BMPs

City staff and City contractors observe BMPs during maintenance, repair and construction work at the Waterfront:

- Vacuuming debris on decks or roadways during work
- Power-washing and/or scrubbing roadways and parking lots for oil and stain removal (recovered and deposited into sewer system)
- Monthly trash-enclosure cleaning at Waterfront Center Building
- Placing booms around projects sites near the water
- Placing crew in skiffs in the water to scoop debris
- Monitoring beaches to ensure all debris is retrieved
- Removing any leaking equipment from service
- Maximize construction in the Maintenance Yard, not at construction sites

E. Oil Absorbent Pad Distribution

Funded by the CalRecycle grant noted earlier, the Department distributes

recyclable absorbent bilge pads that boaters use to soak up oily bilges and prevent leaks while fueling. The number of pads distributed in FY '15 was the same as FY'14 and near the 13-year average, during which time 216,000 pads have been distributed.

Pads Distributed

<u>Year</u>	<u>Pads</u>
FY '03	15,000
FY '04	18,000
FY '05	20,000
FY '06	17,000
FY '07	14,400
FY '08	14,000
FY '09	17,500
FY '10	17,500
FY '11	21,000
FY '12	17,000
FY '13	15,000
FY '14	15,000
FY '15	15,000

F. Bird Protection

The Department tracks bird rescues and recoveries, which it coordinates with the Wildlife Care Network. Results in FY '15 show a significant spike in the number of sick or dead cormorants and common murre. According to the Wildlife Care Network, this was primarily due to a lack of forage fish in warming El Niño waters.

Bird Rescues and Recoveries

<u>Year</u>	<u>Birds</u>
FY '11	29
FY '12	81
FY '13	115
FY '14	38
FY '15	268

G. Marine Mammal Rescues

The Department coordinates with the Channel Islands Marine Wildlife Institute (CIMWI) to rescue ailing marine mammals in the Harbor. In 2015, rescues were over double the annual amount from the three previous years. CIMWI officials say many rescues were pups weaned from their mother and unable to fend for themselves due to a lack of forage fish in El Niño-warmed ocean waters.

Marine Mammal Rescues

<u>Year</u>	<u>Rescues</u>
2012	43
2013	49
2014	45
2015	299

4. Pollution Prevention and Abatement Projects

A. “Salad Boat”

Augmenting maintenance staff’s routine efforts, a contractor working from the dock and/or a 13’ skiff, removes litter and debris from the harbor on alternate Saturdays and following harbor events or storms. This improves the harbor’s appearance, encourages a clean-ocean environment and helps maintain access to boat slips.

As in past years, west-facing docks (especially in Marina One) continue to exhibit a “comb effect,” catching debris as it exits the harbor, pushed by prevailing west wind and counter-clockwise ebb tides. In addition, Area C near the launch ramp, followed by the wind-protected Area J inside the breakwater at the southwest end of the harbor (see map, Attachment 6) were common areas for debris collection. As there were very few storms in 2015, debris flow from storm drains into the north side of the harbor was minimal.

B. Abandoned Watercraft Abatement and Vessel Turn-In Grants

In 2015, the Department exhausted a DBW-funded \$10,000 Abandoned Watercraft Abatement Fund grant used to remove abandoned boats when their owners default on their obligation to do so. The Department removed 5 abandoned boats in FY ’15.

Abandoned Boats

<u>Year</u>	<u>Boats</u>
FY ‘06	14
FY ‘07	10
FY ‘08	13
FY ‘09	6
FY ‘10	15
FY ‘11	10
FY ‘12	2
FY ‘13	3
FY ‘14	3
FY ‘15	5

For the fifth consecutive year, the City also participated in DBW’s Vessel Turn-In Program (VTIP), which allowed voluntary surrender of vessels that would

potentially be abandoned and likely end up in the East Beach anchorage. Operating with a (nearly-exhausted) DBW-funded \$8,800 grant good until October, 2016, following is the Department’s record of disposed VTIP vessels:

Surrendered (VTIP) Boats

<u>Year</u>	<u>VTIP Boats</u>
FY '11	10
FY '12	2
FY '13	1
FY '14	9
FY '15	3

Last year, DBW combined its AWAFF and VTIP grant programs into a Surrendered and Abandoned Vessel Exchange (SAVE) program. The Department received a \$30,200 SAVE grant good through September 30, 2017.

C. Operation Clean Sweep

Operation Clean Sweep, a volunteer seafloor cleanup program, has removed 16.2 tons of debris from the harbor during nine annual one-day events. Typical debris includes barbecues, bicycles, plastic barrels, boat propellers, outboard engines and an occasional marine battery. This year’s event (May 7th) will target Marina Four, where the program began 10 years ago.

5. Education

Staff disseminates Clean Marina information via *Docklines* and *The Log* newspaper, as well as other local media outlets, including KEYT, *Santa Barbara News Press* and City TV (channel 18). It also distributes literature from California Sea Grant, the California Coastal Commission, DBW and the U.S. Coast Guard. Harbor Patrol educates boaters in the field, distributing pollution packets describing BMPs for clean boating and environmentally sound boat maintenance.

Other recent outreach efforts included:

- Posting Spanish/English oil-disposal educational signage at designated oil recycling centers;
- Participation in UCSB’s Microbial Source Tracking project, to determine source of non-point source pollutants that end up in the ocean; and
- Maintenance of an email “Fishermen’s List Serve,” used, for example, to remind fishermen to dispose fish waste like dead crabs or lobster bait in the proper manner, not leave it in the open or dump it in the harbor.

6. Compliance and Enforcement

A. Marine Sanitation Device (MSD) Inspections

Dye-tabling MSDs (“holding tanks”) is required for boats visiting Santa Barbara Harbor and for new slip and live-aboard assignments. The number of MSD inspections in FY ’15 was 601—a bit low, in part due to a reduced number of visitors during Phase Five of the eight-phase Marina One construction project (J and K fingers). Current visitor-slip occupancy suggests the same may be true through FY ’18, when the Marina One project concludes.

<u>Year</u>	<u>MSD Inspections</u>
FY '03	1,230
FY '04	1,280
FY '05	1,199
FY '06	1,259
FY '07	1,370
FY '08	1,160
FY '09	992
FY '10	837
FY '11	770
FY '12	640
FY '13	666
FY '14	704
FY '15	601

B. Discharge Violations

There were 10 known pollution violations in FY ’15, average for the past five years and far below average since the Department began tracking these in FY ’05. Seven resulted in warnings, three in citations (one pack of cigarettes dumped in the harbor, one citation crumpled and thrown in the harbor and a single cigarette thrown in the harbor—all in defiance of Harbor Patrol contacts). Overall, the ratio of warnings to citations continues to reflect the Department’s emphasis on education as a primary enforcement tool, as well as boaters’ general compliance with pollution-prevention laws.

<u>Year</u>	<u>Total</u>	<u>Warnings</u>	<u>Cites</u>
FY '05	32	29	3
FY '06	19	16	3
FY '07	22	19	3
FY '08	22	18	4
FY '09	14	13	1
FY '10	19	16	3
FY '11	14	12	2
FY '12	10	8	2
FY '13	9	7	2
FY '14	7	7	0
FY '15	10	7	3

COST SUMMARY:

Storm Water Pollution Prevention Plan	\$8,760
Dry Season Water Quality Testing	\$2,370
Salad Boat	\$6,760
* Oil-Absorbent Pads	\$4,500
* Abandoned Vessel/VTIP Disposal	\$16,434
East Beach Water Quality Testing	\$7,790
Replace Dockside Debris Nets	\$1,300
* Hazmat Turn-In Disposal (set up & oil only)	\$3,800
Hazmat Turn-In Disposal (HHW)	\$5,100
* Used-Oil Disposal	\$10,400
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Total Annualized Program Cost:	\$67,214
* Grant Funded/Reimbursed Costs:	(\$35,134)
FY '15 Adjusted Clean Marina Program Cost:	\$32,080

ANNUAL CLEAN MARINA PROGRAM COSTS:

FY 2003	\$40,647
FY 2004	\$25,476
FY 2005	\$27,627
FY 2006	\$32,400
FY 2007	\$33,770
FY 2008	\$25,900
FY 2009	\$25,163
FY 2010	\$21,792
FY 2011	\$21,543
FY 2012	\$35,140
FY 2013	\$38,018
FY 2014	\$58,310
FY 2015	\$32,080

CONCLUSION:

The Clean Marina Program contributes to the Department's overall mission, with annual costs remaining stable. The Program highlights the importance of maintaining a clean ocean environment for those who visit, recreate or work in Santa Barbara Harbor, as well as the marine and avian life that depend on it to thrive.

- Attachments:
1. Water Quality Sampling Results—Harbor
 2. Water Quality Sampling Map—Harbor
 3. East Beach Mooring Area Water Quality Test Results—2015
 4. East Beach Mooring Area Water Quality Sampling Map
 5. Dissolved Oxygen Sampling Results—Harbor

Annual Review—Clean Marina Program

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6. Salad Boat Debris Cleanup Map

7. Salad Boat Annual Report

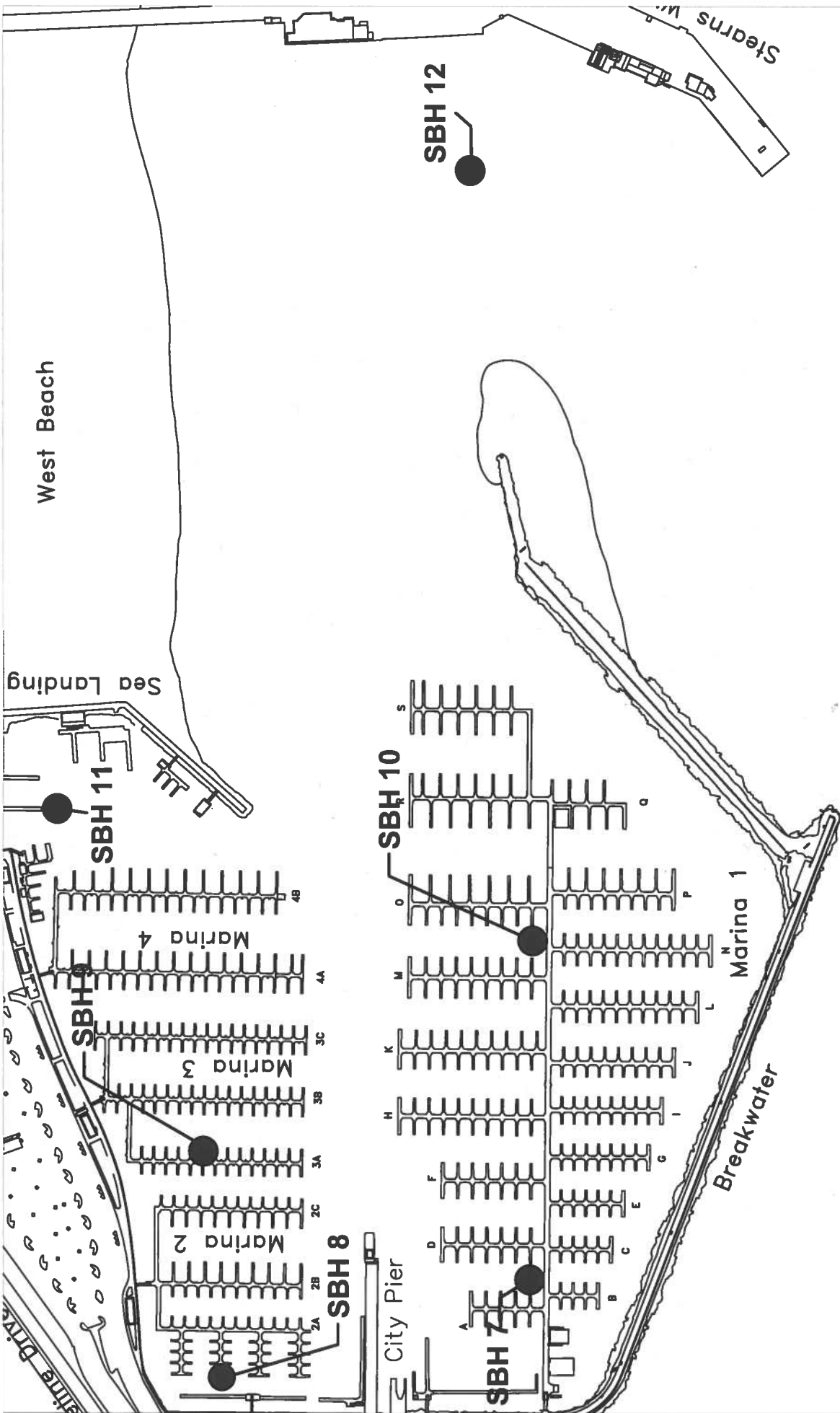
Prepared by: Mick Kronman, Harbor Operations Manager

**SANTA BARBARA HARBOR
WATER QUALITY TEST RESULTS
2015**

Total Coliform MPN/100mls						
Station	April	May	June	August	September	October
SBH #7	161	52	63	63	85	158
SBH #8	63	341	187	1467	121	3448
SBH #9	216	218	52	457	275	299
SBH #10	41	134	94	51	52	20
SBH #11	74	183	52	496	74	332
SBH #12	41	1019	31	74	292	62
SBH #13	>24192	20	<10	20	20	10
Limit: <10,000 MPN/100mls						

Fecal Coliform MPN/100mls						
Station	April	May	June	August	September	October
SBH #7	<10	20	52	<10	20	<10
SBH #8	<10	20	<10	74	52	173
SBH #9	<10	<10	<10	269	0	10
SBH #10	<10	10	<10	10	0	<10
SBH #11	<10	<10	10	31	52	41
SBH #12	20	<10	<10	85	86	10
SBH #13	<10	<10	<10	<10	0	<10
Limit: < 400 MPN/100mls						

Enterococcus MPN/100mls						
Station	April	May	June	August	September	October
SBH #7	<10	10	10	<10	0	20
SBH #8	<10	31	<10	41	<10	10
SBH #9	<10	<10	<10	<10	20	<10
SBH #10	<10	10	<10	<10	<10	<10
SBH #11	<10	<10	<10	<10	0	20
SBH #12	<10	<10	<10	52	0	10
SBH #13	<10	<10	<10	<10	<10	<10
Limit: < 104 MPN/100mls						

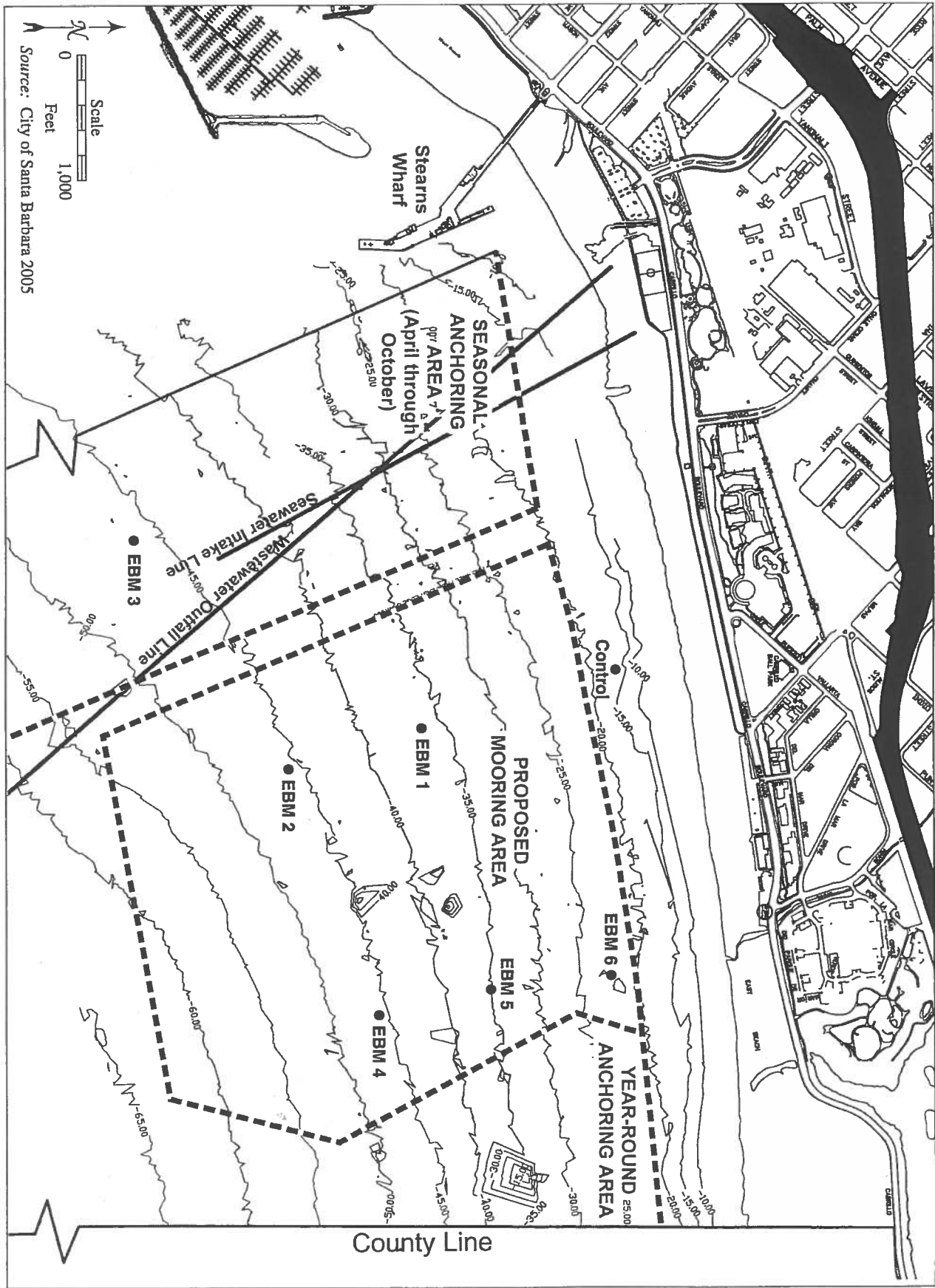


**EAST BEACH MOORING
WATER QUALITY TEST RESULTS
2015**

Total Coliform MPN/100ml			
Station	June	August	September
EBM #1	<10	<10	<10
EBM #2	<10	<10	<10
EBM #3	<10	<10	<10
EBM #4	<10	<10	<10
EBM #5	<10	<10	<10
EBM #6	<10	20	<10
CONTROL	<10	<10	<10
Limit:		< 10,000 MPN/100 ml	

Fecal Coliform MPN/100ml			
Station	July	August	September
EBM #1	<10	<10	<10
EBM #2	<10	<10	<10
EBM #3	<10	<10	<10
EBM #4	<10	<10	<10
EBM #5	<10	<10	<10
EBM #6	<10	10	<10
CONTROL	<10	<10	<10
Limit:		< 400 MPN/100ml	

Enterococcus MPN/100ml			
Station	July	August	September
EBM #1	<10	<10	<10
EBM #2	<10	<10	<10
EBM #3	<10	<10	<10
EBM #4	<10	<10	<10
EBM #5	<10	<10	<10
EBM #6	<10	<10	<10
CONTROL	<10	<10	<10
Limit:		< 104 MPN/100ml	



Map 1. Proposed Mooring and Anchoring Areas

Dissolved Oxygen Levels in the Harbor

1/29/2015

		<i>Near Surface DO</i>	<i>Near Bottom DO</i>
Station #7	Marina 1A002	5.50 mg/l	5.16 mg/l
Station #8	Marina 2B300	4.70 mg/l	4.80 mg/l
Station #9	Marina 3A030	5.17 mg/l	4.73 mg/l
Station #10	Marina 1M001	5.56 mg/l	5.89 mg/l
Station #11	West Finger of Launch Ramp	4.92 mg/l	4.67 mg/l
Station #12	Red Bouy #10, Mouth of Harbor	6.78 mg/l	6.82 mg/l
Station #13	Control, 100 yards Offshore	7.34 mg/l	7.37 mg/l

2/26/2015

		<i>Near Surface DO</i>	<i>Near Bottom DO</i>
Station #7	Marina 1A002	4.77 mg/l	5.50 mg/l
Station #8	Marina 2B300	4.78 mg/l	4.94 mg/l
Station #9	Marina 3A030	5.10 mg/l	5.37 mg/l
Station #10	Marina 1M001	6.35 mg/l	6.09 mg/l
Station #11	West Finger of Launch Ramp	5.45 mg/l	5.64 mg/l
Station #12	Red Bouy #10, Mouth of Harbor	6.69 mg/l	7.05 mg/l
Station #13	Control, 100 yards Offshore	7.83 mg/l	7.98 mg/l

3/12/2015

		<i>Near Surface DO</i>	<i>Near Bottom DO</i>
Station #7	Marina 1A002	5.02 mg/l	5.96 mg/l
Station #8	Marina 2B300	4.95 mg/l	4.64 mg/l
Station #9	Marina 3A030	5.77 mg/l	6.05 mg/l
Station #10	Marina 1M001	5.66 mg/l	5.60 mg/l
Station #11	West Finger of Launch Ramp	5.43 mg/l	5.35 mg/l
Station #12	Red Bouy #10, Mouth of Harbor	7.12 mg/l	7.45 mg/l
Station #13	Control, 100 yards Offshore	8.09 mg/l	8.07 mg/l

4/28/2015

		<i>Near Surface DO</i>	<i>Near Bottom DO</i>
Station #7	Marina 1A002	6.07 mg/l	5.33 mg/l
Station #8	Marina 2B300	5.51 mg/l	5.56 mg/l
Station #9	Marina 3A030	6.69 mg/l	6.16 mg/l
Station #10	Marina 1M001	6.23 mg/l	5.55 mg/l
Station #11	West Finger of Launch Ramp	5.39 mg/l	4.88 mg/l
Station #12	Red Bouy #10, Mouth of Harbor	6.93 mg/l	7.02 mg/l
Station #13	Control, 100 yards Offshore	7.14 mg/l	7.28 mg/l

6/11/2015

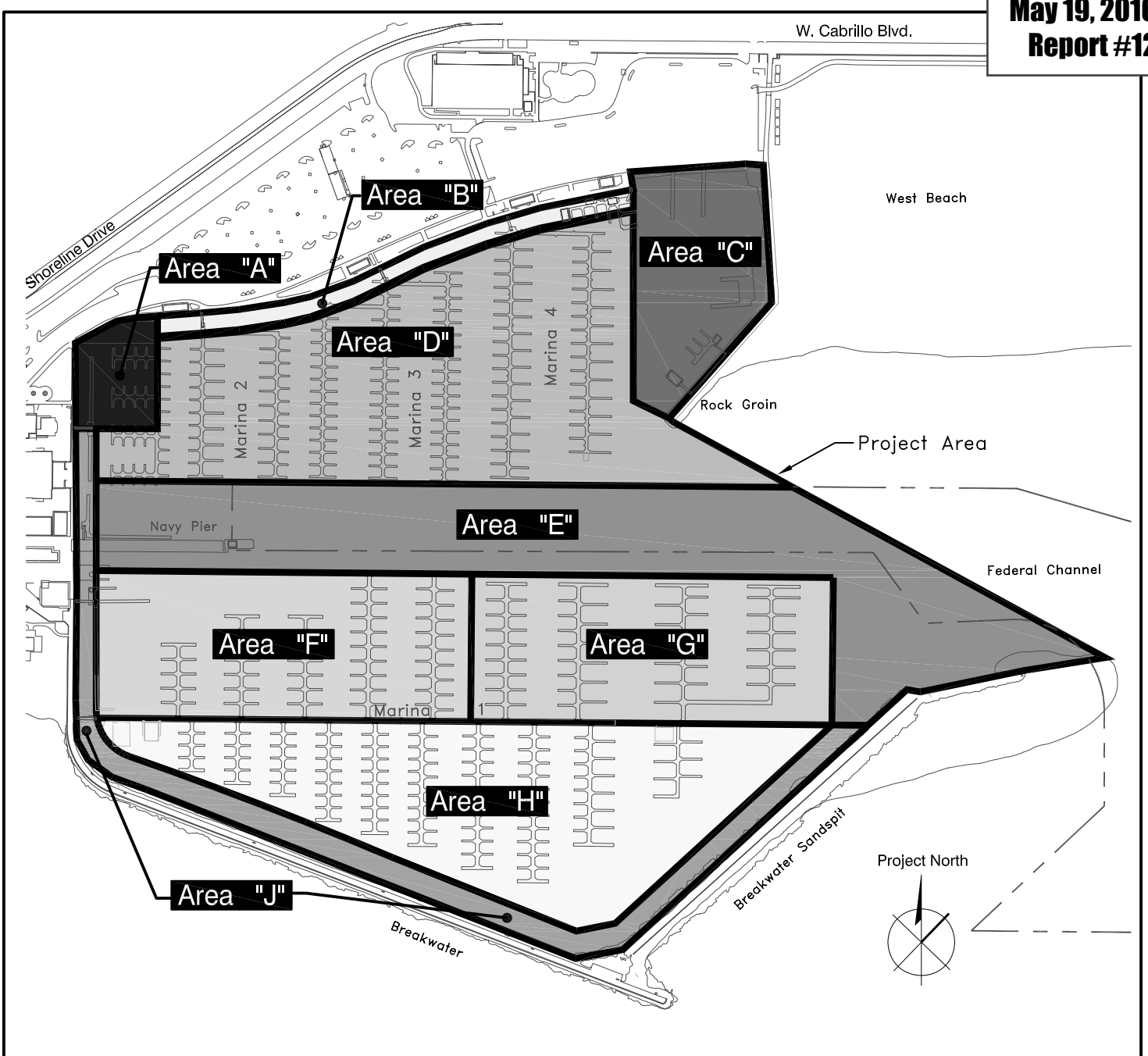
		<i>Near Surface DO</i>	<i>Near Bottom DO</i>
Station #7	Marina 1A002	7.72 mg/l	6.50 mg/l
Station #8	Marina 2B300	6.49 mg/l	5.63 mg/l
Station #9	Marina 3A030	7.32 mg/l	7.26 mg/l
Station #10	Marina 1M001	6.70 mg/l	5.89 mg/l
Station #11	West Finger of Launch Ramp	6.48 mg/l	5.16 mg/l
Station #12	Red Bouy #10, Mouth of Harbor	7.36 mg/l	7.34 mg/l
Station #13	Control, 100 yards Offshore	8.54 mg/l	8.36 mg/l

6/25/2012

		<i>Near Surface DO</i>	<i>Near Bottom DO</i>
Station #7	Marina 1A002	6.52 mg/l	5.45 mg/l
Station #8	Marina 2B300	5.35 mg/l	5.57 mg/l
Station #9	Marina 3A030	6.54 mg/l	5.60 mg/l
Station #10	Marina 1M001	6.67 mg/l	5.79 mg/l
Station #11	West Finger of Launch Ramp	5.82 mg/l	5.62 mg/l
Station #12	Red Bouy #10, Mouth of Harbor	7.51 mg/l	7.76 mg/l
Station #13	Control, 100 yards Offshore	7.88 mg/l	7.92 mg/l

Dissolved Oxygen Levels in the Harbor

		<i>Near Surface DO</i>	<i>Near Bottom DO</i>
8/6/2015			
Station #7	Marina 1A002	6.31 mg/l	6.45 mg/l
Station #8	Marina 2B300	6.01 mg/l	5.64 mg/l
Station #9	Marina 3A030	5.45 mg/l	6.09 mg/l
Station #10	Marina 1M001	6.35 mg/l	6.44 mg/l
Station #11	West Finger of Launch Ramp	5.78 mg/l	5.28 mg/l
Station #12	Red Bouy #10, Mouth of Harbor	6.91 mg/l	6.95 mg/l
Station #13	Control, 100 yards Offshore	7.55 mg/l	7.73 mg/l
9/2/2015			
Station #7	Marina 1A002	4.52 mg/l	4.88 mg/l
Station #8	Marina 2B300	5.12 mg/l	5.13 mg/l
Station #9	Marina 3A030	5.14 mg/l	5.19 mg/l
Station #10	Marina 1M001	5.12 mg/l	5.58 mg/l
Station #11	West Finger of Launch Ramp	4.54 mg/l	4.80 mg/l
Station #12	Red Bouy #10, Mouth of Harbor	6.09 mg/l	6.40 mg/l
Station #13	Control, 100 yards Offshore	7.12 mg/l	7.12 mg/l
10/14/2015			
Station #7	Marina 1A002	2.64 mg/l	1.90 mg/l
Station #8	Marina 2B300	5.60 mg/l	4.00 mg/l
Station #9	Marina 3A030	5.60 mg/l	5.85 mg/l
Station #10	Marina 1M001	5.60 mg/l	6.31 mg/l
Station #11	West Finger of Launch Ramp	5.03 mg/l	4.49 mg/l
Station #12	Red Bouy #10, Mouth of Harbor	6.95 mg/l	7.63 mg/l
Station #13	Control, 100 yards Offshore	7.33 mg/l	8.34 mg/l
10/28/2015			
Station #7	Marina 1A002	4.49 mg/l	4.10 mg/l
Station #8	Marina 2B300	3.59 mg/l	3.65 mg/l
Station #9	Marina 3A030	4.00 mg/l	4.60 mg/l
Station #10	Marina 1M001	4.86 mg/l	4.40 mg/l
Station #11	West Finger of Launch Ramp	3.96 mg/l	4.54 mg/l
Station #12	Red Bouy #10, Mouth of Harbor	6.66 mg/l	6.80 mg/l
Station #13	Control, 100 yards Offshore	7.28 mg/l	7.29 mg/l
12/9/2015			
Station #7	Marina 1A002	6.66 mg/l	6.11 mg/l
Station #8	Marina 2B300	6.36 mg/l	6.18 mg/l
Station #9	Marina 3A030	6.44 mg/l	6.17 mg/l
Station #10	Marina 1M001	6.53 mg/l	6.25 mg/l
Station #11	West Finger of Launch Ramp	5.95 mg/l	5.94 mg/l
Station #12	Red Bouy #10, Mouth of Harbor	7.15 mg/l	7.00 mg/l
Station #13	Control, 100 yards Offshore	7.60 mg/l	7.75 mg/l
12/15/2015			
Station #7	Marina 1A002	6.32 mg/l	6.27 mg/l
Station #8	Marina 2B300	6.34 mg/l	6.03 mg/l
Station #9	Marina 3A030	6.29 mg/l	6.27 mg/l
Station #10	Marina 1M001	5.81 mg/l	6.32 mg/l
Station #11	West Finger of Launch Ramp	5.79 mg/l	5.62 mg/l
Station #12	Red Bouy #10, Mouth of Harbor	7.31 mg/l	7.32 mg/l
Station #13	Control, 100 yards Offshore	7.27 mg/l	7.22 mg/l



Cleanup Date: _____ Operator: _____

Cleanup Hours: _____

Debris Profile:

<input checked="" type="checkbox"/>	Area "A"
<input type="checkbox"/>	Area "B"
<input type="checkbox"/>	Area "C"
<input type="checkbox"/>	Area "D"
<input type="checkbox"/>	Area "E"
<input type="checkbox"/>	Area "F"
<input type="checkbox"/>	Area "G"
<input type="checkbox"/>	Area "H"
<input type="checkbox"/>	Area "J"

General Comments:

F:\DATA\AUTOCAD\ARCHIVED DRAWINGS\LOCATIONS CODES\1000\1000-33r.dwg 02/04/2002 04:49:53 PM PST

**CUSHMAN CONTRACTING CORPORATION
P.O. Box 147
Goleta, CA 93116-0147**

Subject: Harbor Debris Cleanup Summary; July, 2015-March, 2016
Date: March 3, 2016

Again this year, no extraordinary events or additional effort has been required beyond the set maintenance schedule of three (3) hours every other week.

During the course of our Harbor Debris cleanup efforts much regularity has been noticed.

Most west-facing docks and fingers are the primary collecting spots for debris. The reason this side collects more debris is most likely due to the direction in which debris are moving. The wind, along with the out-to-sea current at low tide is in a south-southeasterly direction. This results in a "comb like" effect, trapping the debris in these areas and pushing it toward Area "C" in the northeast corner of the harbor.

Area "C" was again the area where we picked up the most trash followed by Area "J"; every time we worked in the harbor these areas contained debris. Because there are more areas for trash and debris to collect in at these areas "C" and "J", this is where our main effort has been concentrated this year.

Area "C" is in the vicinity of the boat launch. The main collection point in this area is along the east side of the harbor along the rock jetty. This is most likely due to the same easterly moving debris direction described above. This area sometimes requires cleanup by skiff or some small vessel; although we mainly get the rock area by foot. The trash usually stays right by the drain located in the rocks.

Area "J" inside of the breakwater and in the southwest corner of the harbor is protected from the wind by the adjacent seawall. Low tide reveals a sand bar inside the breakwater walkway area that also tends to catch debris. This area had the second most encounters with trash and debris this year.

As there were no major storms of any duration, Area "H" had very little debris. After a storm this area tends to have a fair amount of debris. We use a skiff on a regular basis to clean this area.

A second collection area for debris is in the areas of the Harbor designated as "A" and "B" on the maintenance map. Area "A" is in the vicinity of the storm drain outfall in the northwest corner of the harbor closest to Shoreline Drive. Area "B" is all along the north side of the harbor in the rocks below the seawall in Marinas 2, 3, and 4. For cleanup, a skiff or some small vessel is the

only way to reach these areas. These areas are monitored at least once a month and always after holidays. The majority of trash when picked up in this area is after a storm; otherwise it is usually one of the cleanest areas in the harbor. These areas again had very few debris this year.

Areas "D", "G", and "F" are where the boats slips are. Area "E" is the main channel. No major cleanup or efforts were required in any of these areas this year.

This year the debris collected included; candy and food wrappers, dead birds, tennis balls, rope, wine bottles, beer cans, water bottles, foam, drinking straws, bottle tops, sunscreen containers, buckets, oil diapers, plastic bags, painted and unpainted dimensional wood, and balloons. Three small buoys were also recovered. Clear light small plastics (water bottle caps, candy and food wrappers) along with dead birds were the most prevalent items found this year. Due to the lack of large storms or the previous die-off due to warmer water temperatures; very little kelp was found within the harbor. Sticks and palm fronds were found after the smaller storms and rain runoff we had.

There was a great increase in dead birds (mainly cormorants) found this year. Over forty-one (41) birds have been found to date. Twelve (12) of this total were found in one day in Area "J" along the southeast corner of the harbor near the Breakwater Sandspit. Last year only thirteen (13) dead birds had been found in the Harbor by this time, and in the previous year only twenty (20) had been found. The cause of this increased mortality rate is unknown. One dead skunk was also found.

We have continued to find that walking along the marinas and docks is more time efficient, covers a larger area and produces a much higher volume of debris than working from our skiff. A skiff is only used in areas inaccessible by foot, for removal of larger debris, and where it is more efficient. This method was used only intermittently this year.